

Smart thorn in the digital side

Strategies to improve public debate on smart cities

Danielle Arets, Gerard Schouten, Jo-An Kamp, Leon Heuts, Martina Huynh

Abstract

Over the past decades, there has been a growing interest in the Smart City concept by policymakers across the globe. A smart city is a city that uses technology to improve public services, like transportation, and sustainability. Furthermore, smart cities promise public participation, democratization and innovative urbanism. Despite these promises, it often remains unclear how citizens benefit from the smart city. A growing number of studies critically point out that business interests have taken precedence over social and cultural interests in the Smart Cities (Harvey, 200). Also privacy issues are not getting enough attention (Eubanks, 2019). On top of the societal debate on the desirability of Smart City developments is hardly conducted. Journalists have a key role in catalysing public discussions on smart city developments, but as our study points out, they are lacking interest and skills to do so adequately. There is a genuine underappreciation for the topic of Smart Cities in local journalism. A conversational toolkit, supporting critical scrutiny around technological-ethical developments could possibly offer a great support to journalism -and the public at large- in improving the public debates around the smart city.

Keywords

Smart Cities, Data Journalism, Debate, Design Research

Introduction

As more than half of the world's population lives in cities, cities have come to play a more prominent role in broad societal challenges such as poverty, climate change and health. Facing these challenges, a growing number of cities have been looking at ICT infrastructures and emerging smart technologies to strengthen innovation policy and urban governance (Batty et al. 2012; Caragliu and Del Bo 2012) resulting in a Smart City strategy.

The term Smart City has been around since the turn of the century (Boorsma, 2017), however the concept is often not well defined (Hollands, 2008, Hajer and Dassen, 2014, De Waal, Dignum, 2017). The term refers both to technology-driven urban innovations, such as cities with a 5G network, as well as cities that are strongly committed to tackling social and environmental sustainability or to increasing urban participation. The Smart City label is also used in debates about both the Creative City and cities with a strong knowledge economy (Hollands, 2008, De Waal & Dignum, 2017).

Although a growing number of cities have embraced a Smart City Strategy, this is not accompanied with undivided enthusiasm. Over the past decades, a growing number of scholars have pointed out that business interests have taken precedence over social and cultural interests in the Smart Cities (Harvey, 200). Because of the potential for new services, many companies want to turn a city into a Smart City market (Chen et al, 2014, p. 175).

Furthermore privacy issues are ignored and legal and policy structures are not up to speed with the developments (Cels, de Jong, and Nauta 2012). With the eager interference of companies in urban dynamics, new power relations arise that need to be critically examined (Hollands, 2008). This concerns issues as who the data belongs to. There is a great deal of uncertainty, both politically and legally around this (Thierer, 2014).

On top of this citizens are hardly consulted about smart city developments. A growing number of scholars stress that citizens should have a stronger voice in smart city developments; eg to discuss new forms of administration, manners and responsible use of data and above all how 'smart citizens' want to live in that city (Frissen et al, 2018, Leonard, 2016, Van Dijk et al, 2016. Schaefer, Van Es, Meijer, 2016).

Journalists have a pivotal role in addressing this debate. However, are the current journalistic tools and mindsets suitable to inform, counterbalance and instigate the debate around smart city challenges? That was the key question in our research project *Smart Thorn in a digital Side*; a joint research project (January 2019- December 2020) by the research groups Big data & AI and Journalism & Responsible Innovation, supported by the Smart Society Working Group of Fontys University of Applied sciences.

Mixed research methods

For this project the research team consisted of 2 big data experts, a philosopher, a journalist researcher and a design researcher. Furthermore, we teamed up the research team (technology, law and ethics experts) of the Technology Cycle Impact Toolkit (ICT) of Fontys University of Applied Sciences.

The research concentrated on 3 smart cities in the region of North Brabant (The Netherlands): Eindhoven, Tilburg and Helmond. These 3 cities claim to be frontrunners in information and communication technologies in order to increase operational efficiency and improve both the quality of services and citizen welfare.

The city of Eindhoven, the fifth largest city of the Netherlands, initiated as one of the first Dutch smart cities the living lab Stratumseind: an entertainment area where sensor- and data technology, noise detection, twitter analyses and data analysis—are used for instantaneous monitoring to turn this district into a safer and more pleasant environment. Companies and governmental bodies collaborate in this, monitoring citizen movements by means of smart sensors and surveillance cameras.

The City of Helmond started in 2019 with the smart city district Brandevoort that aims to be the smartest district in the world. Water and energy supplies, transport movements, but also the health of the residents are being optimized using smart technologies.

Finally the smart city Tilburg focuses dominantly on smart mobility and is testing self-driving cars, trucks that are connected via Wi-Fi and drive in 'platoons', and traffic lights that react to oncoming traffic.

The focus of our study was not to examine whether the smart strategies in these cities have resulted in safer, healthier and more mobile cities, but whether the smart strategies have been adequately discussed in public debates. To figure this out, we executed our research in 3 phases using mixed methods.

1. In the first phase we used *discourse analysis* to indicate how the theme of smart city (and its derivatives such as data-driven city, smart city) has been addressed in the local and national media, using sentiment analysis to get a better picture of the discourse.
2. In the second phase, *semi-structured interviews* were executed with journalists, chief editors, policy makers and aldermen in aforementioned three smart cities.
3. In the final phase, the research findings were used as input for a *technical and ethical toolkit* aiming at improving the debate.
4. In the final phase the toolkit was tested with journalism students and will be implemented in the curriculum

Underappreciation Smart Cities in local journalism

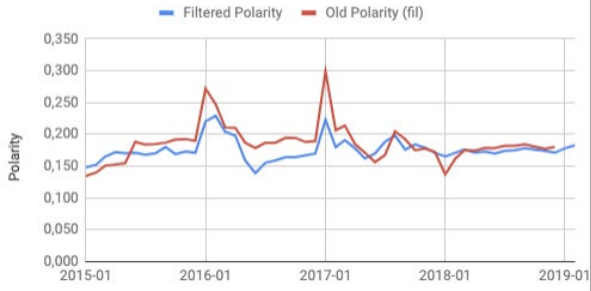
In our first phase, we examined journalistic articles, between January 2015 and December 2019, in both national and local newspapers making use of the journalistic database Lexis Nexis. National news outlets cover topics around smart city developments in the aforementioned three cities more frequently, as opposed to local outlets. In the period (2015 to 2018), a total of 903 articles appeared in Dutch news media on the theme of Smart City and Digital City (search terms: smart city, data-driven, data & city, digital city).

The number of articles has remained almost the same in four years: year 2015: 244, 2016: 216 items, 2017: 202 items, 2018: 231 items

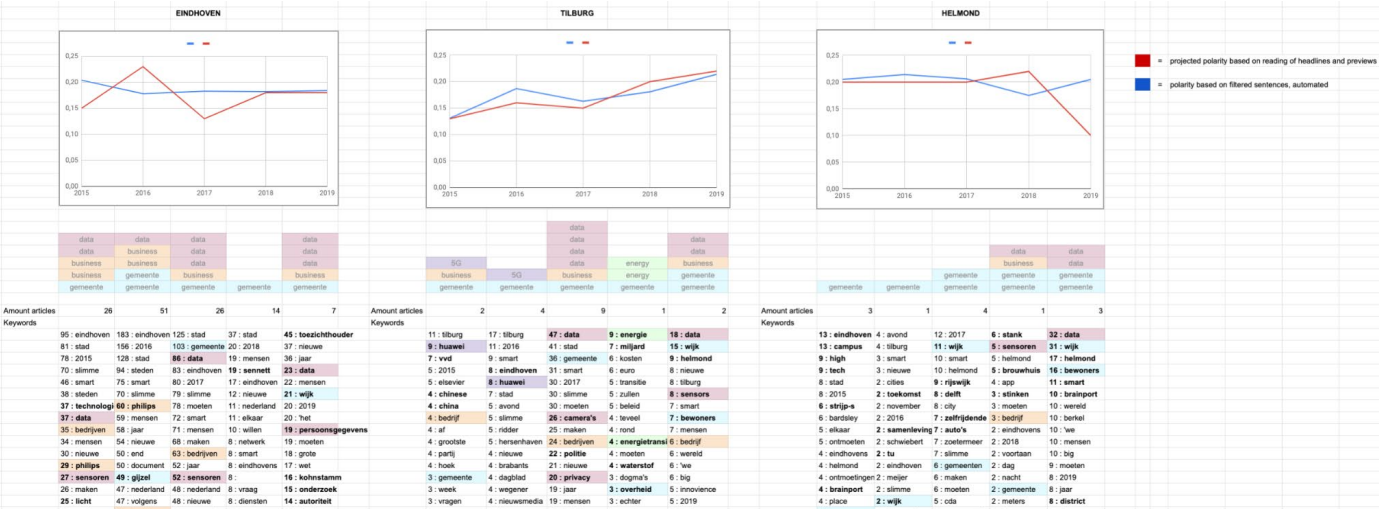
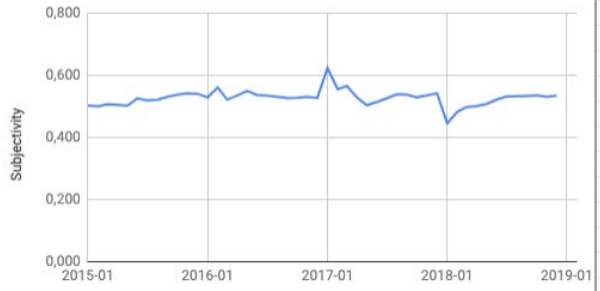
Examining the topics covered, it appeared that in the majority of the articles new developments were being addressed in a rather uncritical manner, e.g. the City of Eindhoven increasing safety by means of smart technology, and the City of Helmond building a new smart neighbourhood using smart sensor technology. The focus of these articles was mainly on addressing the developments and the companies being involved.

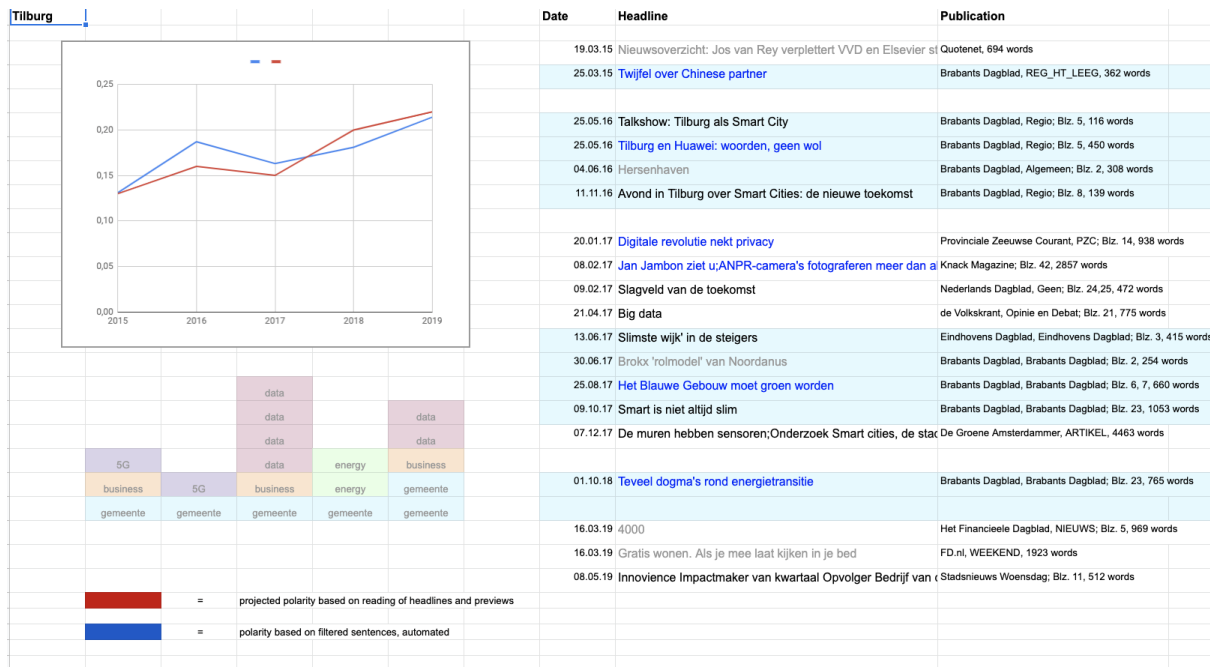
A closer look at the headlines, paired with a sentiment analysis of the articles between January 2015 and December 2019 exposed a considerably more optimistic tone in local newspapers - especially towards the city's own data projects (Figure 1). For this we used (Python's NLTK-based Textblob library) with semantic labels that help with fine-grained analysis; emoticons, exclamation marks and emojis were also taken into consideration. In total we processed 903 articles (2015: 244, 2016: 216, 2017: 202, 2018: 241)

Polarity



Subjectivity





Subjectivity ranges between [0 and 1].

We came to understand that the journalistic coverage of Smart City developments is predominantly optimistic, especially in local newspapers. Important developments around privacy and public-private partnerships are underexposed. Critical reporting on developments in the smart city is sparse.

Phase 2: lack of understanding

In the second phase, semi-structured interviews were conducted with 6 journalists, 2 chief editors, 2 aldermen and 3 policy makers of local outlets in Eindhoven, Tilburg and Helmond. Topics that were touched upon were interest and knowledge on smart city developments, personal opinions on these developments and the role of journalism within smart city transformations.

The interviews revealed a great lack of knowledge and digital skills: 5 out of 6 consulted journalists and chief editors mention they were hardly aware of discussions around smart city developments. Furthermore, 2 of them mention a lack of interest to critically examine developments as 'the public would not be interested' or the 'topic is too abstract to translate into a good story'. When bringing up specific developments as the GDPR, 2 journalists mentioned they hardly knew what it was about.

This lack of knowledge and interest in these developments does not only apply to journalism. Civil servants are also struggling with this too. The 2 civil servants and aldermen we interviewed mentioned they need to be better informed on the manner and they assign a major role to journalists. Furthermore they appointed the need for a more public debate as

they feel important decisions are being made without good public deliberation on these matters.

Recent Dutch studies stress the need for a stronger role and position for government where it concerns a good vision on what technology is used for in the smart city and making sure the fundamental human rights are safeguarded. A study by Dutch consultancy agency Berenschot in 2017, commissioned by the Dutch Municipalities, shows that the Smart City concept is barely embedded in municipalities and that the many risks in terms of privacy, security and freedom of choice have not been mapped out. There is a genuine lack of knowledge at a municipal level (Van Zoonen 2020). Other studies show that also knowledge at the provincial level (Kool et al, 2019) and on a national level is limited.

Despite the fact that the Smart City concept is booming, it was hardly on the agenda during the municipal and provincial elections of 2018 (Wesselink 2019), nor at the state elections (2021). Only recently the four major cities have an alderman with 'smart city' in their portfolio (Van Zoonen, 2020).

Phase 3: Technology Impact Cycle Tool

To better shape the debate on the smart city, it is important to increase the publicness of the debate and widen the discourse. In doing so, it is especially important not to pit technology and ethics against each other as it is a common fallacy that digital society would threaten ethics (Verbeek, 2011). In many debates, people invoke the human condition to set limits to some technology they consider threatening. However, practice shows that these boundaries are constantly being crossed and thus shifted and adapted. We must therefore examine and explore how technology affects our norms and values and how technology also fuels ethical innovation. Technology and society must be examined and discussed precisely from the point of view of their intertwined relationship (Verbeek, 2011).

Verbeek and Tijink (2019) argue for the normative guidance of technical developments, amongst which Smart City developments. A wide variety of citizens and disciplines including ethicists, should be involved at an early stage in the development of Smart services and systems in order to better understand the possible consequences of technological innovations.

The topic of digital ethics is gaining interest, as evidenced by the growing number of academic publications in this area (Mathieu, van Eck, Van Putten, Van den Hoven, 2018). In recent years, various conversation tools and methods are being developed that should help to improve the debate around this matter.

As most of these tools are aimed at policy makers and decision makers we were looking for a more public friendly tool that could empower journalists to better address the debate on smart city developments. For this we collaborated with our collegial research team developing the Technology Impact Cycle Tool (www.tict.io).

The Technology Impact Cycle Tool is a conversation tool that helps to estimate the impact of (new) technology by asking questions on the possible or potential impact it could bring to society. The tool offers 3 scans: a quick scan for public use, an improvement scan and a full

scan for more professional use. Each scan consists (multiple) questions in the following 10 categories: impact on society, hateful and criminal actors, privacy, human values, stakeholders, data, inclusivity, transparency, sustainability, inclusivity and futuring.



Figure 3: TICT toolkit

A nice thing about the toolkit is that the questions are not only meant for people or students working in/with technology, but they also can be used by people who are not technologically interested by nature, like journalists or policy makers. The toolkit can help anyone to broaden their view about the relationship between technology and society by creating a technology impact document that gives an overview (both from a technical as well as from a social perspective) of possible issues like privacy, inclusivity or unconscious bias which could otherwise be easily overlooked.

The tool was tested in two workshops with journalism students. The questions in the toolkit appeared to be very helpful as the journalist-in-training mentioned it gave them very good insights on possible lines of questioning and took away the fear of not knowing enough about the subject to do a proper interview.

To conclude

Journalists should be(come) smarter thorns in the digital side and critically examine whether Smart City developments are in check with societal values and above all if the outcomes of it are desirable for citizens. As smart city policies are supporting new ways of organising and managing cities, they are also impressing new logics. Citizens should not only be informed on these matters but also should be able to discuss these new logics and have a say in it. For this they need to be better informed. Journalists have a key role to play in this, but in order to better address the debate they need more knowledge in this matter. The Technology Impact Cycle Tool proved to be very helpful to discuss complicated matters. More research on how these strategies could be used in journalism is needed.